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Production and antifungal activity of reuterin

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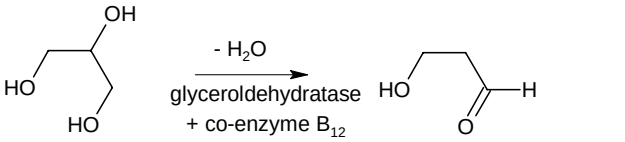
Reuterin, which comprises β-hydroxypropionaldehyde and its hydrated and dimeric forms, is a small valuable compound that can be used in a myriad of applications. Because of its antimicrobial activity, reuterin can be applied as such in food preservation or produced *in situ* by the reuterin-producing strain, *Lactobacillus reuteri*, in probiotic formulas. Reuterin can also be used as a precursor for the synthesis of several chemicals such as acrolein, acrylic acid and 1,3-propanediol [1] and as an alternative to glutaraldehyde in the sterilization and fixation of prostheses derived from biological tissue [2].

Reuterin can be produced via traditional chemistry and by bacterial bioconversion. The bio-process is based on a simple and clean single enzymatic step, which converts the renewable and cheap resource glycerol with high yield into β-hydroxypropionaldehyde. We have studied this bioconversion by using viable cell suspensions of *Lactobacillus reuteri* and partially optimized the process for the production of pure reuterin.



glycerol **β-hydroxypropionaldehyde**

We have also assessed the antifungal activity of reuterin, which was found to inhibit the growth of a range of spoilage fungi (*Penicillium, Aspergillus* etc.) and also *Bacillus* sp. on an agar-plate assay with reuterin added to a flour-containing medium. Contrary to the well studied antibacterial activities, the antifungal metabolites of lactic acid bacteria remain far less explored [3]. Reuterin could act as a model bio-active molecule in this context.

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[2] Chen, C., Sung, H., Liang, H. & Chang, W. (2002). *Journal of Biomedical Materials Research 61*, 360-369.

[3] De Muynck, C., Leroy, A. De Maeseneire, S., Arnout F., Soetaert, W. & Vandamme, E. (2004). *Microbiological Research 159*, 339-346.